

REMARKS

Claims 1, 2, and 39-41 are pending. In the Office action mailed December 4, 2007, all claims stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite and, further, under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claims 1, 2, 40, and 41 are also rejected under 35 U.S.C. § 102(b) as being anticipated by the Affymetrix Human Genome U95A array (hereinafter “the Genome Array”). Claim 39 is also rejected as being obvious over the Genome Array in view of U.S. Patent No. 5,541,308 (hereinafter “Hogan”). Each of these rejections is addressed below.

The Invention

The invention is directed to a microarray with nucleic acid molecules that either (a) encode polypeptides of complex I, II, III, IV, or V of the mitochondrial respiratory chain, which are naturally coded for by a nuclear gene, or (b) are fragments of such nucleic acid molecules.

Claim amendments

Claims 1 and 2 have been amended to clarify the claim language. These amendments add no new matter.

Rejection under 35 U.S.C. § 112, second paragraph

Claims 1-2 and 39-41 stand rejected as being indefinite. In making this rejection, the Office asserts that it is unclear whether the “consisting of” language is actually meant to limit the array to particular numbers and types of nucleic acid probes. The Office points to the “comprising” language of claim 2 to suggest that claim 1 can be interpreted more broadly, i.e., as not being limited to particular numbers or types of nucleic acid probes. Applicants respectfully disagree with the Office’s interpretation of these claims.

Nonetheless, to clarify, Applicants have amended claims 1 and 2 to remove reference to “an array” and, further, have amended claim 2 to remove the “comprising” language. Thus, claim 1 and its dependent claims now clearly each recite a solid support onto which is bound particular nucleic acid molecules. Applicants submit that the “consisting of” language of claim 1 limits the particular number and types of nucleic acid molecules on the claimed microarray. This rejection may therefore be withdrawn.

Claim 1, 2, and 39-41 also stand rejected, as the Office asserts that it is unclear how fragments of 15 nucleotides can encode polypeptides of complex I, II, III, IV, or V of the mitochondrial respiratory chain. Applicants have amended claim 1 to clarify that “15 nucleotides in length” refers to the size of the fragments, not the size of the nucleic acid molecules encoding the polypeptides. On this basis, Applicants submit that this rejection may also be withdrawn.

Claims 40 and 41 are rejected, based on the assertion that claim 1 is drawn to probes which are at least 15 nucleotides in length, whereas claim 40 is drawn to probes that are at least 10 nucleotides in length. Applicants respectfully disagree. Claim 40 requires that the microarray consist of at least *10 nucleic acid molecules*, not that the nucleic acid molecules themselves be at least 10 nucleotides in length. Reconsideration and withdrawal of this rejection is requested.

Rejection under 35 U.S.C. § 112, first paragraph

Claims 1, 2, and 39-41 are rejected as failing to comply with the written description requirement. These claims are rejected because the Office asserts that the claims are drawn to any fragment of at least 15 nucleotides which encodes a polypeptide of complex I, II, III, IV, or V of the mitochondrial respiratory chain, and that the specification does not describe which fragments of these nucleic acids are critical for functionality. Applicants respectfully disagree, in the context of the present amendments. Claim 1 has been amended to recite that the fragments are (emphasis added) “of the

nucleic acid molecules of (a), *said fragments* being at least 15 nucleotides in length...” Thus, it is the fragments, not the nucleic acid molecules encoding proteins, that are 15 nucleotides in length. Accordingly, the Office’s statement that “there is insufficient guidance to design probes that maintain the function of encoding a polypeptide of complex I, II, III, IV, or V” simply does not apply to these claims, as Applicants’ amendments clarify that the claimed fragments need not encode functional polypeptides.

Indeed, the Office acknowledges that “the skilled artisan can design probes to hybridize to targets.” Office action, page 10. And there is no dispute that nucleic acids encoding the polypeptides of complex I, II, III, IV, and V are described in the art. The fragments must only be capable of hybridizing to an appropriate test nucleic acid, and nucleic acid fragments of fifteen nucleotides are of sufficient length for doing so. The claimed microarray does not require that the 15 nucleotide fragments “maintain the function of encoding a polypeptide,” and whether or not such fragments maintain such encoding function is irrelevant to the microarray.

For these reasons, the claimed nucleic acids and nucleic acid fragments are sufficiently described by the specification. On this basis, the written description rejection may be withdrawn.

Rejection under 35 U.S.C. § 102(b)

Claims 1, 2, 40, and 41 are rejected as being anticipated by the Genome Array, which is asserted to include all limitations of these claims. Applicants respectfully disagree. Claim 1 requires that at least 90% of the nucleic acid molecules of the microarray either encode a polypeptide of complex I, II, III, IV, or V of the mitochondrial respiratory chain or be fragments of such nucleic acid molecules at least 15 nucleotides in length. As set forth above, Applicants have amended claims 1 and 2 to clarify that the microarray is limited to the numbers and particular nucleotides recited in these claims. The Genome Array includes 12,000 genes from human genome, far too many for 90% of

its nucleic acid molecules to be the molecules recited in the claims. On this basis, Applicants submit that the Genome Array does not provide all claim limitations of claim 1 or its dependent claims, and thus cannot anticipate these claims. This rejection may therefore be withdrawn.

Rejection under 35 U.S.C. § 103(a)

Claim 39 is rejected as being obvious over the Genome Array in view of Hogan. The Genome Array is asserted to possess all limitations of claim 39, with the exception of teaching probes of at least 40 nucleotides. Hogan is asserted to overcome this deficiency by teaching probes between 15 and 50 nucleotides in length. Applicants respectfully traverse this rejection.

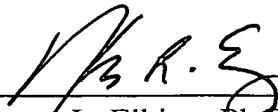
Obviousness requires that the reference or combination of references teach all claim limitations. As outlined above, claim 1 and its dependent claims, including claim 39, require that at least 90% of the nucleotides of the claimed microarray either encode a polypeptide of complex I, II, III, IV, or V of the mitochondrial respiratory chain or be fragments thereof. Because neither the Genome Array nor Hogan, alone or in any combination, teach these claim limitations, these references cannot render claim 39 obvious. On this basis, this rejection may be withdrawn.

CONCLUSION

Applicants submit that the claims are in condition for allowance, and such action is respectfully requested. If there are any charges or any credits, please apply them to Deposit Account No. 03-2095.

Respectfully submitted,

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